gas generated by natural or forced evaporation of LNG was developed and put into use.

[6] Such a ship fueled by LNG is referred to as an LNG fueled ship (LFS). With tightened international emission standards for ships and stabilization of LNG prices, consumption of LNG as a marine fuel is expected to increase.

【Disclosure】

【Technical Problem】

[7] Embodiments of the present invention seek to provide a system for supplying LNG to a ship engine as fuel, which can prevent system failure, thereby enabling smooth fuel supply.

【Technical Solution】

[8] In accordance with one aspect of the present invention, a fuel supply system for a ship engine includes: a submerged pump disposed in an LNG storage tank of a ship and supplying LNG to the ship engine;

[9] a high-pressure pump receiving LNG from the submerged pump and pressurizing the LNG to a high pressure; and

[10] a return channel for returning LNG upstream of the high-pressure pump to the LNG storage tank to secure a minimum flow rate of the submerged pump,

[11] wherein the return channel is branched at a point closer to the high-pressure pump than the submerged pump and wherein a flow rate of LNG returned through the return channel is regulated to control a temperature of LNG in front of the high-pressure pump to suppress generation of boil-off gas at the front end of the high-pressure pump.

[12] Preferably, the fuel supply system further includes: a flow control valve disposed in the return channel; a flow controller controlling a flow rate of LNG returned to the LNG storage tank to secure a minimum flow rate of the submerged pump; and a temperature controller detecting a temperature of LNG in front of the high-pressure pump and controlling the flow rate of LNG returned to the LNG storage tank to maintain the temperature of LNG in front of the high-pressure pump below a liquefaction temperature of LNG, wherein the flow control valve controls the flow rate of LNG returned to the LNG storage tank under control of the flow

controller and the temperature controller.

[13] Preferably, the fuel supply system further includes: a fuel supply channel for supplying LNG from the LNG storage tank to the engine; and a vaporizer disposed in the fuel supply channel, re-gasifying pressurized LNG from the high-pressure pump, and supplying re-gasified LNG to the engine.

[14] Preferably, the engine is a high-pressure gas injection engine fueled by a high-pressure gas compressed to a high pressure of 150 bar to 400 bar.

[15] Preferably, the LNG storage tank is a pressure-resistant tank and has a design pressure set to retain BOG or flash gas generated in the pressure-resistant tank during operation of the ship.

[16]

[17] In accordance with another aspect of the present invention, a fuel supply method for a ship engine includes: delivering LNG from an LNG storage tank of a ship to a high-pressure pump by the submerged pump; pressurizing the LNG to a high pressure by the high-pressure pump; re-gasifying the LNG pressurized by the high-pressure pump; and supplying the re-gasified LNG to the ship engine, wherein LNG upstream of the high-pressure pump is returned to the LNG storage tank to secure a minimum flow rate of the submerged pump, and a flow rate of LNG to be returned is regulated to control a temperature of LNG in front of the high-pressure pump below a liquefaction temperature of LNG to suppress generation of boil-off gas at the front end of the high-pressure pump, and wherein the return flow is branched at a point closer to the high-pressure pump than the submerged pump.

[18] Preferably, the flow rate of LNG returned to the LNG storage tank is regulated to maintain the temperature of LNG in front of the high-pressure pump below a liquefaction temperature of LNG.

[19] Preferably, the engine is a high-pressure gas injection engine fueled by a high-pressure gas compressed to a high pressure of 150 bar to 400 bar.

【Advantageous Effects】

[20] Embodiments of the present invention provide a fuel supply system for a ship engine in which LNG is delivered from an LNG storage tank of a ship to a high-pressure pump by a submerged pump and then pressurized to a high pressure by high-

【CLAIMS】

【Claim 1】

A fuel supply system for a ship engine, comprising;

a submerged pump disposed in an LNG storage tank of a ship and supplying LNG to the ship engine;

a high-pressure pump receiving LNG from the submerged pump and pressurizing the LNG to a high pressure; and

a return channel for returning LNG upstream of the high-pressure pump to the LNG storage tank to secure a minimum flow rate of the submerged pump,

wherein the return channel is branched at a point closer to the high-pressure pump than the submerged pump and

wherein a flow rate of LNG returned through the return channel is regulated to control a temperature of LNG in front of the high-pressure pump to suppress generation of boil-off gas at the front end of the high-pressure pump.

【Claim 2】

The fuel supply system according to claim 1, further comprising:

a flow control valve disposed in the return channel;

a flow controller controlling a flow rate of LNG returned to the LNG storage tank to secure a minimum flow rate of the submerged pump; and

a temperature controller detecting a temperature of LNG in front of the high-pressure pump and controlling the flow rate of LNG returned to the LNG storage tank to maintain the temperature of LNG in front of the high-pressure pump below a liquefaction temperature of LNG;

wherein the flow control valve controls the flow rate of LNG returned to the LNG storage tank under control of the flow controller and the temperature controller.

【Claim 3】

The fuel supply system according to claim 1, further comprising:

a fuel supply channel for supplying LNG from the LNG storage tank to the engine; and

a vaporizer disposed in the fuel supply channel, re-gasifying pressurized

LNG from the high-pressure pump, and supplying re-gasified LNG to the engine.

【Claim 4】

The fuel supply system according to claim 1, wherein the engine is a high-pressure gas injection engine fueled by a high-pressure gas compressed to a high pressure of 150 bar to 400 bar.

【Claim 5】

The fuel supply system according to claim 1, wherein the LNG storage tank is a pressure-resistant tank and has a design pressure set to hold BOG or flash gas generated in the pressure-resistant tank during operation of the ship.

【Claim 6】

A fuel supply method for a ship engine, comprising:

delivering LNG from an LNG storage tank of a ship to a high-pressure pump by the submerged pump;

pressurizing the LNG to a high pressure by the high-pressure pump;

re-gasifying the LNG pressurized by the high-pressure pump; and

supplying the re-gasified LNG to the ship engine,

wherein LNG upstream of the high-pressure pump is returned to the LNG storage tank to secure a minimum flow rate of the submerged pump, and a flow rate of LNG to be returned is regulated to control a temperature of LNG in front of the high-pressure pump below a liquefaction temperature of LNG to suppress generation of boil-off gas at the front end of the high-pressure pump,

and wherein the return flow is branched at a point closer to the high-pressure pump than the submerged pump.

【Claim 7】